

REMARKS

The above amendment and these remarks are responsive to the Office Action issued on April 1, 2003. By this response, claims 1, 2, 5, 6, 8-10, 12, 13, and 15-17 are amended, and claims 4 and 7 are cancelled without prejudice. No new matter is introduced. Claims 1-3, 5, 6 and 8-17 are now active for examination. A petition for a three-month extension of time is submitted concurrently herewith.

The Office Action dated April 1, 2003 allowed claim 17. Claims 1-4 and 8-16 under 35 U.S.C. §103(a) were rejected as being unpatentable over Todokoro (U.S. Patent Nos. 5,900,629 and 6,069,356) in view of Breton (U.S. Patent No. 4,943,722), Matsumoto (U.S. Patent No. 5,874,735) and JP411067130A, and claim 7 stands rejected under 35 U.S.C. §103(a) as being obvious over Todokoro in view of Breton, Matsumoto and JP411067130A, and further in view of Plies (U.S. Patent No. 7,769,543). The Office Action objected to claim 16 for lacking antecedent basis, and to claims 5 and 6 for depending on a rejected base claim, but the Examiner indicated that claims 5 and 6 would be allowable if they were rewritten into independent form including every limitation of the base claim and any intervening claims.

The objection and rejections are respectfully traversed in view of the claim amendment and remarks presented herein.

THE REJECTIONS OF CLAIMS 4 AND 7 ARE NOW MOOT

By this Response, claims 4 and 7 are cancelled without prejudice. Therefore, the rejections of claims 4 and 7 are now moot.

CLAIM 17 IS PATENTABLE

The Office Action dated April 1, 2003 allowed claim 17. By this Response, claim 17 is amended to improve wording. No new matter is introduced. It is respectfully submitted that claim 17 remains retains its original scope and therefore patentable over the documents of record.

THE OBVIOUSNESS REJECTION OF CLAIMS 1-3, 5, 6 AND 8-17 IS TRAVERSED

Claims 1-3, 5, 6 and 8-17 were rejected as being obvious over Todokoro in view of Breton, Matsumoto and JP411067130A. The obviousness rejection is respectfully traversed because the documents cited in the Office Action cannot support a prima facie case of obviousness.

By this Response, claim 1 is amended. After the amendment, claim 1 recites: "A scanning electron microscope comprising:...a first deflector and a second deflector to shift an irradiation position of a primary electron beam emitted...on a specimen; and an objective lens that focuses the primary electron beam; and wherein...the first deflector, disposed closer to the specimen than the second deflector, forms a deflecting electric field in a region corresponding to an effective principal plane of the objective lens, and the first deflector is an octupole deflector that includes a plurality of conductor plates, a primary electron beam passing aperture and insulating slits extending radially from the primary electron beam aperture." Claim 1, as amended, includes specific descriptions of the first deflector, such as a lower deflector, used in the scanning electron microscope. The first deflector is an octupole deflector that includes a plurality of conductor plates, a primary electron beam passing aperture and insulating slits extending radially from the primary electron beam aperture. Appropriate support for the amendment can be found in, for example, page 18, lines, 14-20 and Fig. 6.

None of the documents cited in the Office Action teaches a scanning electron microscope that includes a deflector as now described in claim 1. Todokoro relates to a scanning microscope that uses a specific type of scanning deflector (see Fig. 14 of Todokoro). Todokoro, however, does not describe or suggest that the scanning deflector should include a plurality of conductor plates, a primary electron beam passing aperture, and insulating slits extending radially from the primary electron beam aperture, as that described in claim 1.

Breton and Matsumoto were cited by the Examiner as secondary evidence for suggesting that the deflectors described in Todokoro can be used as image shifting deflectors (see item 5 of the Office Action), and the other document, JP411067130A, was cited by the Examiner to show that it is not unusual to have a first magnetic field followed by a second electric field (see item 5 of the Office Action). None of Breton, Matsumoto and JP411067130A describes or suggests the structure of a deflector as described in claim 1. Therefore, Breton, Matsumoto and JP411067130A do not teach a scanning deflector including a plurality of conductor plates, a primary electron beam passing aperture, and insulating slits extending radially from the primary electron beam aperture, as described in claim 1.

Since none of Todokoro, Breton, Matsumoto and JP411067130A teaches the structure of the first deflector as described in claim 1, the cited documents, even combined, do not teach every limitation recited in claim 1. Therefore, Todokoro, Breton, Matsumoto and JP411067130A cannot support a prima facie case of obviousness. The obviousness rejection is hence untenable and should be withdrawn.

Other documents of record also fail to teach a scanning deflector including a plurality of conductor plates, a primary electron beam passing aperture, and insulating slits extending radially

from the primary electron beam aperture, as described in claim 1. Thus, claim 1 is patentable over the documents of record. Favorable reconsideration of claim 1 is respectfully requested.

Claims 2, 3 and 8-11 depend on claim 1 and incorporate every limitation thereof. As the documents cited by the Examiner fail to teach every limitation recited in claim 1, the cited documents also fail to teach every limitation of claims 2, 3 and 8-11 for at least the same reasons as discussed relative in claim 1 as well as for their own merits. Favorable reconsideration of claims 2, 3 and 8-11 is respectfully requested.

Claim 15 was also rejected as being obvious over Todokoro in view of Breton, Matsumoto and JP411067130A. By this Response, claim 15 is amended to recite "A scanning electron microscope comprising:...an image shifting deflector means that includes a first deflector and a second deflector to shift a center of scanning;...wherein...the first deflector is an octupole deflector that includes a plurality of conductor plates, a primary electron beam passing aperture and insulating slits extending radially from the primary electron beam aperture, and the laser beam travels through insulating slits formed between the conductor plates." Thus, the scanning electron microscope of claim 15 uses a first deflector, such as a lower deflector, that includes a plurality of conductor plates, a primary electron beam passing aperture, and insulating slits extending radially from the primary electron beam aperture. The scanning microscope also uses a laser beam that travels through the insulating slits. Appropriate support for the amendment can be found in, for example, page 18, lines, 14-20 and Fig. 6.

In contrast, the documents cited by the Examiner do not teach a scanning electron microscope having a specific structure as described in claim 1. As discussed earlier relative to claim 1, Todokoro is related to a scanning microscope that uses a specific type of scanning deflector (see Fig. 14 of Todokoro). Todokoro, however, does not describe or suggest that the scanning deflector

should includes a plurality of conductor plates, a primary electron beam passing aperture, and insulating slits extending radially from the primary electron beam aperture, as that described in claim 15. Furthermore, Todokoro does not use a laser beam to measure the height of samples. Therefore, Todokoro also fails to teach that "the laser beam travels through insulating slits formed between the conductor plates," as recited in claim 15.

Other documents cited by the Examiner do not alleviate the deficiencies of Todokoro. Breton, Matsumoto and JP411067130A were cited by the Examiner as secondary evidence for suggesting that the deflectors described in Todokoro can be used as image shifting deflectors (see item 5 of the Office Action), or that it is not unusual to have a first magnetic field followed by a second electric field (see item 5 of the Office Action). None of Breton, Matsumoto and JP411067130A specifically teaches the structure of a deflector constructed as that described in claim 15. Although Breton discusses using a laser beam to make a height measurement of samples, Breton does not address how the laser beam would interact with the insulating slits of the first deflector.

Since none of the documents cited in the Office Action teaches the structure of the first deflector as described in claim 15, the cited documents, even combined, do not teach every limitation recited in claim 15. Therefore, the cited documents cannot support a prima facie case of obviousness. The obviousness rejection is hence untenable and should be withdrawn. Favorable reconsideration of claim 15 is respectfully requested.

Claim 12, as amended, recites: "A scanning electron microscope comprising:...an objective lens that focuses the primary electron beam using a magnetic field leaked from a lens gap of the objective lens; wherein...the first deflector,...interposed between the objective lens and the specimen, wherein the retarding electric field crating means deflects the primary electron beam

using an electrostatic field to offset a deflection caused by a leaked magnetic field.” Therefore, a scanning electron microscope according to claim 12 includes an objective lens that uses a magnetic field leaked from a lens gap to focus a primary electron beam projected on a sample. The microscope further includes a first deflector, such as a lower deflector, that is interposed between the objective lens and the specimen. A retarding electric field creating means is provided to use an electrostatic field to deflect the primary electron beam to cancel the deflection caused by the magnetic objective lens. Appropriate support for the amendment can be found at least in Fig. 2 and page 12, line 4 through page 15, line 25.

In contrast, the documents relied on by the Examiner do not teach the features described in claim 12. Although JP411067130 appears to use a two-stage deflectors to deflect the electron beam, the deflectors are disposed above and by the objective lens, not interposed between the objective lens and the specimen. Thus, JP411067130 does not teach “the first deflector,...interposed between the objective lens and the specimen, wherein the retarding electric field creating means deflects the primary electron beam using an electrostatic field to offset a deflection caused by a leaked magnetic field,” as recited in claim 12.

Todokoro discusses an electrostatic deflector, however, the deflector is disposed above the magnetic objective lens. Thus, Todokoro do not disclose a first deflector that is “interposed between the objective lens and the specimen,” and “the retarding electric field creating means deflects the primary electron beam using an electrostatic field to offset a deflection caused by a leaked magnetic field,” as described in claim 12. The other two cited patents, Breton and Matsumoto, also fail to disclose that “the first deflector, interposed between the objective lens and the specimen, wherein the retarding electric field creating means deflects the primary electron beam using an electrostatic field to offset a deflection caused by a leaked magnetic field,” as recited by claim 12. Therefore,

Todokoro, JP411067130, Breton and Matsumoto, even combined, do not teach every limitation of claim 12. Other documents of record also fail to teach the specific structure of the first deflector as described in claim 12. Claim 12 is therefore patentable over the patents and/or publications cited by the Examiner. Favorable reconsideration of claim 12 is respectfully requested.

Claims 13 and 14 depend on claim 12 and incorporate every limitation thereof. As the documents cited by the Examiner fail to teach every limitation recited in claim 12, the cited documents also fails to teach every limitation of claims 13 and 14 for at least the same reasons as discussed relative in claim 12 as well as for their own merits. Favorable reconsideration of claims 13 and 14 is respectfully requested.

Claim 16, after the amendment, recites: "A scanning electron microscope comprising: an electron source; an image shifting deflector system a first deflector and a second deflector to shift an irradiation position of a primary electron beam emitted by the electron source on a specimen; and a magnetic objective lens and an electrostatic lens that focus the primary electron beam; wherein... the first deflector, disposed closer to the specimen than the second deflector and interposed between the objective lens and the specimen, deflects the primary electron beam using an electrostatic field to offset a deflection caused by the magnetic lens." Accordingly, a scanning electron microscope according to claim 16 includes an objective lens that uses a magnetic field to focus a primary electron beam projected on a sample. The microscope further includes a first deflector, such as a lower deflector, disposed near the specimen that is interposed between the objective lens and the specimen, and uses an electrostatic field to deflect the primary electron beam to cancel the deflection caused by the magnetic objective lens. Appropriate support for the amendment can be found at least in Fig. 2 and page 12, line 4 through page 15, line 25.

The patents and/or publication cited in the Office Action, however, do not teach the features described in claim 16. As discussed with respect to claim 12, although JP411067130 appears to use two-stage deflectors to deflect the electron beam, the deflectors are disposed above and by the objective lens. Thus, JP411067130 does not teach that "the first deflector, disposed closer to the specimen than the second deflector and interposed between the objective lens and the specimen, deflects the primary electron beam using an electrostatic field to offset a deflection caused by the magnetic lens," as described in claim 16.

Todokoro discusses an electrostatic deflector, but the deflector is disposed above the magnetic objective lens. Thus, Todokoro does not disclose a first deflector that is "interposed between the objective lens and the specimen," and "deflects the primary electron beam using an electrostatic field to offset a deflection caused by the magnetic lens," as described in claim 16. Breton and Matsumoto, two other patents cited by the Examiner, also fail to disclose that "a first deflector, interposed between the objective lens and the specimen, deflects the primary electron beam using an electrostatic field to offset a deflection caused by the magnetic lens," as described in claim 16.

Since none of Todokoro, JP411067130, Breton and Matsumoto teaches the structure of the first deflector as that described in claim 16, Todokoro, JP411067130, Breton and Matsumoto, even combined, do not teach every limitation of claim 16. Claim 16 is therefore patentable over the patents and/or publications cited by the Examiner. Favorable reconsideration of claim 16 is respectfully requested.

CLAIMS 5 AND 6 ARE PATENTABLE

Claims 5 and 6 depend on claim 1, directly or indirectly, and incorporate every limitation thereof. Claims 5 and 6 were objected to for depending on a rejected base claim, but the Examiner indicated that claims 5 and 6 would be allowable if they are rewritten into independent form including every limitation of the base claim and any intervening claims.

As discussed earlier, claim 1 is patentable over the documents of record. Thus, claims 5 and 6 are also patentable over the documents cited by the Examiner for at least the same reasons discussed relative to claim 1 as well as based on their own merits. Favorable reconsideration of claims 5 and 6 is respectfully requested.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY

A handwritten signature in black ink that reads "Wei-Chen Chen". The signature is written in a cursive, flowing style.

Wei-Chen Chen
Recognized under 37 CFR §10.9(b)

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